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MEMORANDUM FOR: Executive Director-Controller**THROUGH :** Director, Office of Planning, Programming and Budgeting
Deputy Director for Intelligence**SUBJECT :** Proposed Contract with [] for the
Development of an Automatic Target Indexing Device

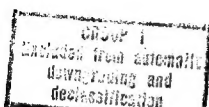
1. This memorandum requests approval for the commitment of funds for a contract. The specific request is stated in Paragraph 12.

2. The high volume of imagery expected in the foreseeable future threatens to place a strain on NPIC's exploitation capability. In order to prepare ourselves we must seek means to automate some aspects of the Center's film processing, handling, and exploitation systems. The NPIC Automatic Target Recognition Program (ATR) offers several promising possibilities for helping to meet the future without large increases in personnel. Our work to date indicates that, of these possibilities, an Automatic Target Indexing Device is the logical first choice for further development, because it has a good chance for technological success and offers a potential for large pay-offs in operational efficiency at NPIC. (By target indexing we mean a yes or no decision as to whether or not a target is cloud-covered--presented in a tabular coordinate print-out form.)

3. We believe that a Target Indexing Device can be incorporated into an automatic system which will ultimately satisfy the following requirements:

- a. Provide an index of the coverage achieved by a mission.
- b. Determine for collectors the "extent and character of coverage" of targets programmed on a mission.
- c. Automatically determine parts of a mission that are completely cloud covered so that they may be eliminated from mass reproduction.

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25X1

At the present time, during mission exploitation, interpreters must complete a frame reference line for all targets imaged. This line includes the location of the target on the frame, the type of coverage, quality of the coverage and its interpretability. When mission scheduling necessitates a quick response, interpreters must postpone their mission search activity until the data on extent and quality of coverage has been obtained. There have been occasions when the PI has had to review the film three separate times in order to meet the time constraints for fulfillment of requirements. At best, the determination, recording, checking and printing of this information for the 3,000 odd targets covered by a mission is quite time consuming.

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4. Under the FY 1968 ATM Program, three promising techniques of automatic target indexing are currently being investigated: electronic clue extraction, holographic filtering, and diffraction pattern analysis. The electronic clue extraction technique and the diffraction pattern analysis currently appear to offer the most promising solutions. The electronic clue extraction has the most flexibility, while diffraction pattern analysis is potentially more exact. A feasibility demonstration with operational imagery has been scheduled for April 1969. A selection will then be made to design the prototype target indexing device.

- 2 -

SECRET

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SUBJECT: Proposed Contract with [Redacted Box] for the Development of an Automatic Target Indexing Device

25X1

5. In FY 1969, it is proposed to contract for the design and construction of the target indexing device. This work will require 16 months and is intended to result in a device that will screen imagery on a target-by-target basis at the rate of about 100 feet of film per minute. (This speed is the upper limit for chemical processing equipment currently planned for use at the film processing site). The program is divided into a six-month design phase, an eight-month fabrication phase, and a two-month period for checkout and delivery. By future design improvements and computer program modifications it should be possible to expand the device's functions to include screening on an area basis and a capability to indicate image quality.

6. There will be an intentional and desirable overlap of the FY 1968 and FY 1969 efforts. This is feasible since some components of the prototype equipment, the film drive for example, can enter design independently of the method selected for the target indexing.

7. Although the main thrust of the FY 1969 program will be toward target indexing, we feel it is prudent to continue a limited amount of more fundamental work toward maintaining state-of-the-art prospects for automated ways to sort and identify selected targets during search and scan operations. For this purpose, approximately 20% of the total funding requested is designated for research against basic ATR problems. Some aspects of [Redacted Box] work in these basic areas are actually "double-tracking" of investigations and studies being performed by other elements of the industrial and academic communities. We are staying abreast of all such related work, and believe that such effort is well worthwhile in view of the very high potential for pay-off. NPIC will obviously use the combination of approaches which indicate the best and first chance of success.

8. This proposed [Redacted Box] program extends over a 16-month period and would be funded entirely from FY 1969 funds. The program will not come up for refunding in the first quarter of FY 1971, thereby avoiding the problem of late quarter expenditures. The increased funds will be made available in the NPIC R&D budget through the deferment, to FY 1970, of several other R&D projects originally scheduled for FY 1969. These projects will in turn be funded in FY 1970 in place of the ATR program.

9. [Redacted Box] is recommended as sole source for this follow-on contract, by virtue of its demonstrated capability, past experience, and unique equipment.

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SUBJECT: Proposed Contract with [] for the Development of an Automatic Target Indexing Device

25X1

10. The Contracting Officer will be requested to negotiate this contract in two phases: a system design, and implementation.

11. This program has been coordinated with DDCST/OSP, DDCST/ORD, and with the Intelligence Community through briefings at NPIC and presentations to EXRAND.

12. It is requested that approval be granted to negotiate with [] for a follow-on contract to develop an engineering prototype automatic target indexing device at a cost not to exceed [] from FY 1969 funds.

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ARTHUR C. LUNDAREL

Director

National Photographic Interpretation Center

Attachment: (1)
Data Systems Division Proposal

APPROVED: _____
Deputy Director for Intelligence

Date

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APPROVED: _____
Executive Director-Comptroller

Date

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